

REMARKS

The Official Action mailed May 23, 2002 has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time.

Applicants note with appreciation the consideration of the Information Disclosure Statements filed on April 7, 1999; March 14, 2000; August 24, 2000; October 19, 2000; December 12, 2000; April 26, 2001; September 5, 2001; December 10, 2001 and February 11, 2002.

Claims 4, 9, 14, 20 and 22-53 are pending in the present application, of which claims 4, 9, 14, 20 and 22-34 are independent. Claims 4, 9, 14, 20, 25-29, 33 and 34 have been amended herewith. For the reasons set forth in detail below, all claims are believed to be in condition for allowance.


Paragraph 2 of the Official Action rejects claims 4, 9, 14, 20 and 22-53 under the doctrine of obviousness-type double patenting based on claims 1-24 of U.S. Patent 5,612,799. It is noted that claims 22-24 and 30-32 of the subject application require that the first hole and the second hole do not overlap to each other and claim 29 has been amended herewith to recite this feature. It is respectfully submitted that the claims of the '799 patent fail to disclose or suggest at least this feature of the present invention and thus that the claims of the subject application cannot be considered obvious in view of the claims of the '799 patent. Furthermore, it appears that this feature of the present invention is not addressed in the Official Action fails to address this feature. Therefore, it is respectfully submitted that the rejection of at least claims 22-24 and 29-32 under the doctrine of obviousness-type double patenting based on the '799 patent is improper and should be withdrawn. Reconsideration is requested.

The remaining independent claims, that is, claims 4, 9, 14, 20, 25-28, 33 and 34, have been amended herewith to recite a second signal line in addition to the lead comprising aluminum and that this second signal line also comprises aluminum. The use of an organic film as a leveling film and the use of a second signal line comprising aluminum are both particularly advantageous for realizing a large size display device, such as a display of a television or portable computer.

It is respectfully submitted that the claims of the '799 patent fails to disclose or suggest this further feature of the present invention. That is, the claims of the '799 patent fail to disclose or suggest a second signal line as recited in the claims as amended herewith and that allowance of these claims would not result in an improper timewise extension of the patent monopoly. Favorable reconsideration is requested in view thereof.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 4, 9, 14, 20, 25-29, 33 and 34 as follows:

4. (Amended) A device having at least one display panel, said-display panel comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode.

9. (Amended) A television comprising:

a tuner for receiving television radio wave;

a display panel operationally connected to said tuner, said display panel comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode.

14. (Amended) A portable computer having a display panel, said display panel comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode.

20. (Amended) A device having at least one display device, said display device comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode.

25. (Amended) A device having at least one display device, said display device comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a first hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode and through a second hole of the organic resin film,

wherein the first hole and the second hole do not overlap to each other.

26. (Amended) A device having at least one display panel, said display panel comprising:

a substrate having an insulating surface;

at least one semiconductor layer formed over said substrate and comprising at least a channel region, source and drain regions with said channel region therebetween;

a gate insulating film adjacent to said channel region;

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an insulating film over at least said semiconductor layer;

a lead electrode comprising aluminum formed over said insulating film and electrically connected to one of the source or drain regions through a first hole of said insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film over said insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said lead electrode through a second hole of the organic resin film.

27. (Amended) A television comprising:

a tuner for receiving television radio wave;

a display panel operationally connected to said tuner, said display panel comprising:

a substrate having an insulating surface;

at least one semiconductor layer formed over said substrate and comprising at least a channel region, source and drain regions with said channel region therebetween;

a gate insulating film adjacent to said channel region; and

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an insulating film over at least said semiconductor layer;

a lead electrode comprising aluminum formed over said insulating film and electrically connected to one of the source or drain regions through a first hole of said insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film over said insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said lead electrode through a second hole of the organic resin film.

28. (Amended) A portable computer having a display panel, said display panel comprising:

a substrate having an insulating surface;

at least one semiconductor layer formed over said substrate and comprising at least a channel region, source and drain regions with said channel region therebetween;

a gate insulating film adjacent to said channel region; and

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an insulating film over at least said semiconductor layer;

a lead electrode comprising aluminum formed over said insulating film and electrically connected to one of the source or drain regions through a first hole of said insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film over said insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said lead electrode through a second hole of the organic resin film.

29. (Amended) A device having at least one display device, said display device comprising:

a substrate having an insulating surface;

at least one semiconductor layer formed over said substrate and comprising at least a channel region, source and drain regions with said channel region therebetween;

a gate insulating film adjacent to said channel region;

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

an insulating film over at least said semiconductor layer;

a lead electrode comprising aluminum formed over said insulating film and electrically connected to one of the source or drain regions through a first hole of said insulating film;

an organic resin film over said insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said lead electrode through a second hole of the organic resin film.

wherein the first hole and the second hole do not overlap to each other, and wherein during applying a reference signal having a varying voltage to the other one of the source or drain regions, a select signal is applied to the gate electrode in order to perform a gradation display.

33. (Amended) A device having at least one display device, said display device comprising:

a substrate having an insulating surface;

at least one semiconductor layer formed over said substrate and comprising at least a channel region, source and drain regions with said channel region therebetween;

a gate insulating film adjacent to said channel region;

a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an insulating film over at least said semiconductor layer;

a lead electrode comprising aluminum formed over said insulating film and electrically connected to one of the source or drain regions through a first hole of said insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film over said insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said lead electrode through a second hole of the organic resin film,

wherein the first hole and the second hole do not overlap to each other.

34. (Amended) A portable computer having a display panel, said display panel comprising:

a substrate having an insulating surface;

at least one thin film transistor formed over said substrate, said thin film transistor including at least a channel region, source and drain regions with said channel region therebetween, a gate insulating film adjacent to said channel region, and a gate electrode adjacent to said channel region with said gate insulating film interposed therebetween;

a first signal line extending in a first direction over said substrate, said first signal line being contiguous to said gate electrode;

an interlayer insulating film covering said thin film transistor;

a lead electrode comprising aluminum formed over said interlayer insulating film and electrically connected to one of the source or drain regions of said thin film transistor through a hole of said interlayer insulating film;

a second signal line formed over said interlayer insulating film and extending in a second direction orthogonal to said first direction, said second signal line electrically connected to the other one of the source or drain regions;

an organic resin film formed over the thin film transistor, said interlayer insulating film and said lead electrode to provide a leveled upper surface; and

a pixel electrode formed over said organic resin film, said pixel electrode being electrically connected to said thin film transistor via said lead electrode,

wherein during applying a reference signal having a varying voltage to the other one of the source or drain regions, a select signal is applied to the gate electrode in order to perform a gradation display.